

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1, 2, 7, 12, 13, 17 and 21 are currently pending in this application. Claims 1 and 7 are amended, and Claims 4, 9, 14-16 and 18-20 canceled by the present amendment.

In the Office Action, Claims 1-2, 4, 7, 9 and 12-21 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 2002/0045361 A1 to Cheung et al. in view of U.S. 6,306,776 B1 to Srinivasan et al.; and the provisional obviousness-type double patenting rejection of Claims 1-2, 4, 7, 9, 12-13 was withdrawn.

Applicants first wish to thank the Examiner Patel for withdrawing the double patenting rejection.

Turning now to the merits, in order to expedite issuance of a patent in this case, Applicants have amended independent Claims 1 and 7 to clarify the patentable features of the present invention over the cited references. Specifically, Applicants' amended Claim 1 recites a method for processing an organosiloxane film, the method including loading a target substrate with a coating film formed thereon into a reaction chamber, the coating film including a polysiloxane base solution having an organic functional group. A heat process is performed on the target substrate within the reaction chamber to bake the coating film. The heat process includes a temperature setting step of setting an interior of the reaction chamber at a process temperature by heating, and a supplying step of supplying a baking gas into the reaction chamber set at the process temperature, while activating the baking gas by a gas activation section disposed outside the reaction chamber, the gas activation section activating the baking gas by bringing the baking gas into contact with a catalyst while supplying the baking gas with heat energy. Also recited is that the baking gas is selected from the group consisting of ammonia gas and dinitrogen oxide gas, the catalyst is tungsten, and the gas

activation section is configured to heat the baking gas to a temperature of from 700 to 1,000°C.

In contrast, the primary cited reference to Cheung et al. discloses a process for forming a low dielectric constant film by chemical vapor deposition (CVD). In this process, an organosilane or organosiloxane compound is used as a silicon source gas along with a carrier gas, and dinitrogen oxide gas may be used as an oxidizing gas. The newly cited reference to Srinivasan et al. discloses a similar process for forming a poly crystalline silicon film by CVD. In this process, elemental hydrogen or hydrogen containing gas, such as HCl, SiH<sub>4</sub>, or SiCl<sub>2</sub>H<sub>2</sub>, is used as a process gas and activated by a pre-activator outside the process chamber. The pre-activator is provided with a catalyst, which may be tungsten.

Thus, both Cheung et al. and Srinivasan et al. disclose a CVD process wherein a film is formed on a substrate in a process chamber. However, the claimed invention relates to a process for forming a film by baking a coating film of a polysiloxane base solution, which is completely different from CVD. Specifically, as recited in the claims, the coating film is present (formed by, e.g., spin coating as described in the specification) on a target substrate when the substrate is loaded into a process chamber. The process according to the present invention is performed on the premise of this state of the coating film on the target substrate. The cited references relate to CVD, and are completely silent about a process for baking a coating film of a polysiloxane base solution.

The Office Action attempts to remedy this deficiency by stating,

However, it would be obvious for one of ordinary skill in the art at the time of the invention to deposit the film onto the substrate before loading into the reaction chamber because selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946).

Applicants submit that this is improper.

First, MPEP section 2144.04 cites *In re Burhans* as follows.

### Changes in Sequence of Adding Ingredients

*Ex parte Rubin*, 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render *prima facie* obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). See also *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results); *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is *prima facie* obvious.).

Thus, the MPEP makes clear that *In re Burhans* and similar cases relate to a mere change in sequence of adding ingredients to arrive at the same end result. As also discussed in MPEP section 2144, the facts in a prior legal decision must be *sufficiently similar* to those in the present application in order for the examiner to use the rationale used by the court. The claimed invention does not simply change the sequence of adding ingredients from that shown in the prior art, but rather provides a method of treating a the coating film that is already present on a target substrate, while the cited references disclose depositing the film on the substrate by a deposition process. Applicants submit that the facts of the this case are completely different from *In re Burhans* and therefore *In re Burhans* cannot be used to support an obvious rejection.

Further, Applicants submit that one would have no reason to provide a substrate already having a dielectric film thereon into the CVD chambers of Cheung et al. and Srinivasan et al. That is, the objective of these cited references is to deposit a film on the substrate. The Office Action provides no rationale for why it would be obvious for one of ordinary skill in the art to take such a substrate having a film thereon and place it into a CVD chamber, or to both deposit a film and treat the film in a CVD chamber.

For the reasons discussed above, Claims 1 and 7 patentably define over the cited references. Nevertheless, Claim 1 has been amended to narrow the baking gas to “the group

consisting of ammonia gas and dinitrogen oxide gas,” recite that “the catalyst is tungsten,” and to recite that the gas activation section is configured to heat the baking gas to a temperature of from 700 to 1,000°C. These features were previously recited in now canceled dependent Claims 4, 14 and 16. Claim 7 has been amended to include these features in apparatus format, which were previously recited in now canceled dependent Claims 9, 18 and 20. Thus, the amendments to Claims 1 and 7 do not raise any issues that require further search and consideration, ***and the present amendment should be entered and considered after final.*** Further, as discussed in the Amendment filed July 16, 2007, this combination of elements makes it possible to provide a process with a low cost and high efficiency.

Thus, the claimed invention employs a baking gas selected from the group consisting of ammonia gas and dinitrogen oxide gas, which is used for forming a nitrogen atmosphere for baking. Cheung et al. discloses dinitrogen oxide gas as one of options of an oxidizing gas for CVD. That is, the dinitrogen oxide gas in Cheung et al. is used for a completely different purpose. Further, Srinivasan et al. discloses tungsten as a catalyst for activating elemental hydrogen or hydrogen containing gas, such as HCl, SiH<sub>4</sub>, or SiCl<sub>2</sub>H<sub>2</sub>. However, this reference is silent about whether tungsten is suitable for a catalyst for activating ammonia or dinitrogen oxide gas as in the present invention. These are additional distinctions of Claims 1 and 7 over the cited references.

For the reasons discussed above, Claims 1 and 7 patentably define over the cited references. As the remaining pending claims depend from Claim 1 or 7, these claims also patentably define over the cited references.

Consequently, in view of the present amendment and in light of the foregoing comments, it is respectfully submitted that the invention defined by Claims 1-9 patentably define over the applied references. The present application is therefore believed to be in

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condition for formal allowance and an early and favorable reconsideration of the application  
is therefore requested.

Respectfully submitted,

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